Nutrient Imbalances in Chesapeake Bay Agricultural Watersheds
Issues, Challenges, and Possible Solutions

Wednesday, August 5
10:00 – 12:00 PM

Expanded Agenda

Purpose: To describe the magnitude of the nutrient imbalances in agricultural watersheds of the Chesapeake Bay basin and discuss choices for addressing imbalances and opportunities for coordination with USDA.

Participants:
Dana York, NRCS, Tom Simpson, Watershed Stewardship, Mark Dubin, UMD MAWP/CBPO, Kelly Shenk, EPA CBPO

1. **Nutrient Imbalances**
   - USDA NRCS and ERS Maps of Excess Manure Nutrients in the U.S. (by county), 1997
     - Reference: USDA Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients: Spatial and Temporal Trends for the United States, Kellogg, Lander, Moffitt, and Gollehon, December 2000.
     - Report shows substantial N and P imbalances (> 2,000,0000 lb/county is the highest reporting category mapped in U.S.) in south-central Pennsylvania, Shenandoah Valley, and Delmarva Peninsula in 1997. These excesses have increased since 1982 by over 300,000 lbs/county.
   - USDA CSREES MAWP Nutrient Budget Analysis – Regions with significant P manure imbalances, 2002 or 2007
   - Delaware nutrient mass balance study - Highlight of results
   - Maryland nutrient mass balance study – Scope, P.I., schedule.
   - CRC White Paper on Delmarva Soil Nutrients 2003 – Highlight of results

2. **Cause of Nutrient Imbalances**
   - Concentrated animal operations and insufficient land result in P application rates that are much higher than what the crop needs and can uptake.
   - High manure nutrient loading regions are in areas with most concentrated animal operations Lancaster, Shenandoah, and Eastern Shore (CBF manure nitrogen map as a visual example).
   - Problems with P-site index – not protective of WQ, can result in P saturation.

3. **Environmental Considerations**
   - Overview of studies showing that desorption happens at 22-25% P saturation levels.

- Green Run study showed that N imbalance was correctable by eliminating manure application and planting cover crops (saw immediate improvement). Improvement in P levels in water will take more time due to P saturation in soils

4. Proposed Solutions for Phosphorus

- Eventual goal is to limit P applications to no more than what can be removed by the crop.
- Shorter term goal would be to limit P application based on P saturation levels in soil.
- Watershed Stewardship, Inc. effort to promote P-saturation-based approach to manure P application on participating farms.
- Implications of pursuing a P-saturation approach.
    - Eventual reduction of P loads to Bay, prevent additional farms from becoming saturated. Protects farms and keeps them viable over long-haul.
    - Excess manure nutrients. Need solutions for excess manure nutrients (use E.O. to drive/create markets, integrator role in helping with solution?, USDA, EPA, states role in providing TA and FA to producers to help with solution, etc.).
    - P legacy issue in soils that are already saturated – will take time for P levels to decline even after application ceases.
- Implications of delaying solutions.
    - P index is harming farmers for the future by allowing P to build up in soils.
    - Problem will be more costly to fix and take longer to see results the more saturated the soils are.

[Note: Nitrogen imbalances are also an issue and can be addressed through a combination of activities such as manure application restrictions (what we do for P will help reduce over application of manure N), nitrogen use efficiency techniques (great examples for corn), cover crops (ala MD DNR Green Run study), etc.]

5. Opportunities for Coordination with USDA

- Revising NRCS 590 Nutrient Management Standard.
    - Can we revise state standards (590 standard) to ensure that P application methods are protective of water quality. For example, based P application on P soil tests particularly in those regions that are already out of balance or have high concentration of animal operations and are likely to get out of balance.
- Providing financial and technical assistance to producers in regions with P imbalances to help them modify application methods and address excess manure nutrients.
- Building markets for manure nutrients.

Handouts:

- USDA maps of manure nutrient excesses in U.S. (by county), 1997

- MAWP nutrient budget handout – Mark.
- DE nutrient budget analysis report (executive summary) – Kelly.
- CRC white paper – Kelly.
- CBF manure map – Kelly.